What is claimed is:

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1. An environment measurement method comprising:

receiving first signals produced in response to a laser beam scattered by said environment;

receiving second signals produced in response to a radar beam scattered by said environment; and

storing data representing said first and second signals, for use in producing a representation of said environment.

2. The method of claim **1** further comprising receiving said laser beam scattered by said environment and producing said first signals in response thereto.

3. The method of claim **1** further comprising producing an incident laser beam for scattering by said environment to produce said laser beam scattered by said environment.

4. The method of claim **3** further comprising directing said incident laser beam to said environment at a desired angle.

5. The method of claim **4** wherein directing comprises adjusting a physical orientation of a beam directing device in response to an orientation signal, to direct said incident laser beam to said environment at said desired angle.

6. The method of claim **5** further comprising producing said orientation signal.

7. The method of claim 5 further comprising directing said laser beam scattered by said environment from said beam directing device to a detector.

8. The method of claim 2 wherein:

receiving said laser beam scattered by said environment comprises receiving scattered portions of a laser pulse scattered by respective portions of said environment; and

producing said first signals further comprises continuously producing data signals in response to said scattered portions of said laser pulse, during a measurement interval of sufficient duration to receive all said scattered portions.

9. The method of claim 1 further comprising producing said second signals in response to said radar beam scattered by said environment.

10. The method of claim 9 further comprising receiving said radar beam scattered by said environment at an airborne receiver, said radar beam having a wavelength of at least on the order of one meter.

11. The method of claim 10 wherein receiving comprises receiving, as said radar beam scattered by said environment, a radar beam having a wavelength between 0.7 and 2 meters.

12. The method of claim 9 further comprising directing an incident radar beam to said environment to produce said radar beam scattered by said environment.

13. The method of claim 12 wherein directing comprises directing to said environment, as said incident radar beam, an ultra-wide band (UWB) radar beam.

14. The method of claim **12** wherein directing comprises transmitting said incident radar beam to said environment from a transmission antenna system, and further comprising receiving said radar beam scattered by said environment at a reception antenna system.

15. The method of claim **14** wherein producing said second signals comprises delaying signals produced by at least some of a plurality of antennae of said reception antenna system.

16. The method of claim **14** wherein said transmission antenna system and said reception antenna system comprise a common transceiving antenna system, and wherein transmitting and receiving comprise transmitting and receiving at said common transceiving antenna system.

17. The method of claim **12** further comprising blanking transmitter cross-talk signals while directing said incident radar beam to said environment.

18. The method of claim **9** wherein producing said second signals comprises producing frequency-shifted signals in response to said radar beam scattered by said environment.

19. The method of claim **18** wherein producing frequency-shifted signals comprises:

producing initial electrical signals at frequencies of said radar beam scattered by said environment, in response thereto; and

applying said initial electrical signals and a mixing frequency signal to a mixer, to produce said frequency-shifted signals.

20. The method of claim **18** wherein producing frequency-shifted signals comprises producing in-phase frequency-shifted signals and in-quadrature frequency-shifted signals.

21. The method of claim **18** wherein producing said second signals further comprises digitizing said frequency-shifted signals.

22. The method of claim **9** further comprising adjustably attenuating said second signals.

23. The method of claim **1** wherein storing said data comprises defining a data structure comprising a measurement context field for storing measurement context information, a laser field for storing said data representing said first signals, and a radar beam field for storing said data representing said second signals.

24. The method of claim **1** wherein storing said data comprises storing measurement context information in association with said data representing said first and second signals.

25. The method of claim **24** wherein storing measurement context information comprises storing global positioning satellite (GPS) information indicative of a location at which at least one of said laser beam and said radar beam is received.

26. The method of claim **24** wherein storing measurement context information comprises storing at least one time value indicative of a time at which at least one of said laser beam and said radar beam is received.

27. The method of claim **24** wherein storing measurement context information comprises storing attenuation information indicative of an amount of attenuation of said second signals.

28. The method of claim **24** wherein storing measurement context information comprises storing a frequency value indicative of a frequency of said radar beam.

29. The method of claim **24** wherein storing measurement context information comprises storing user-inputted information.

30. The method of claim **29** wherein storing measurement context information comprises storing a flight line indication indicative of a flight line over which said laser beam and said radar beam are received by an airborne environment measurement system.

31. The method of claim **1** wherein storing said data representing said second signals comprises storing an in-phase value and an in-quadrature value representing an in-phase component and an in-quadrature component respectively of said second signals.

32. The method of claim **1** further comprising producing said representation of said environment in response to said data.

33. The method of claim **32** wherein producing said representation comprises applying a migration algorithm to said data representing said second signals, to associate said data representing said second signals with particular locations of said environment.

34. The method of claim **32** wherein producing said representation comprises identifying a foliage height of said environment.

35. The method of claim **32** wherein producing said representation comprises identifying a height of a terrain surface of said environment.

36. The method of claim **35** wherein producing said representation further comprises identifying features of said environment below said terrain surface.

37. The method of claim **35** wherein producing said representation further comprises identifying a slope of said terrain surface.

38. The method of claim **32** wherein producing said representation comprises producing a digital elevation model of said environment.

39. The method of claim **32** wherein producing said representation comprises producing at least one contour representation of said environment.

40. An environment measurement system comprising:

a memory device; and

a processor circuit in communication with said memory device, wherein said processor circuit is configured to receive first signals produced in response to a laser beam scattered by said environment, to receive second signals produced in response to a radar beam scattered by said environment, and to store data representing said first and second signals in said memory device, for use in producing a representation of said environment.

41. The system of claim **40** further comprising a detector operable to receive said laser beam scattered by said environment and to produce said first signals in response thereto.

42. The system of claim **40** further comprising a laser operable to produce an incident laser beam for scattering by said environment to produce said laser beam scattered by said environment.

43. The system of claim **42** further comprising a beam directing device operable to direct said incident laser beam to said environment at a desired angle.

44. The system of claim **43** further comprising a motion mechanism operable to adjust a physical orientation of said beam directing device in response to an orientation signal, to direct said incident laser beam to said environment at said desired angle.

45. The system of claim **44** further comprising an orientation monitoring device operable to produce said orientation signal.

46. The system of claim **43** wherein said beam directing device is locatable to direct said laser beam scattered by said environment to said detector.

47. The system of claim **41** further comprising an analog-to-digital converter (ADC) operable to cooperate with said detector to continuously produce data signals in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions.

48. The system of claim **40** further comprising a radar system operable to produce said second signals in response to said radar beam scattered by said environment.

49. The system of claim **48** further wherein said radar system comprises an airborne radar reception system configured to receive, as said radar beam scattered by said environment, a radar beam having a wavelength of at least on the order of one meter.

50. The system of claim **49** wherein said airborne radar reception system is configured to receive, as said radar beam scattered by said environment, a radar beam having a wavelength between **0.7** and **2** meters.

51. The system of claim **48** wherein said radar system is configured to direct an incident radar beam to said environment to produce said radar beam scattered by said environment.

52. The system of claim **51** wherein said radar system is configured to direct to said environment, as said incident radar beam, an ultra-wide band (UWB) radar beam.

53. The system of claim **51** wherein said radar system comprises a transmission antenna system configured to direct said incident radar beam, and a reception antenna system configured to receive said radar beam scattered by said environment.

54. The system of claim **53** wherein said radar system further comprises a delay device operable to delay signals produced by at least some of a plurality of antennae of said reception antenna system.

55. The system of claim **53** wherein said transmission antenna system and said reception antenna system comprise a common transceiving antenna system.

56. The system of claim **51** wherein said radar system further comprises a blanker operable to blank transmitter cross-talk signals while directing said incident radar beam to said environment.

57. The system of claim **48** wherein said radar system further comprises a frequency-shifter operable to produce said second signals by producing frequency-shifted signals in response to said radar beam scattered by said environment.

58. The system of claim **57** wherein:

said radar system is configured to produce initial electrical signals at frequencies of said radar beam scattered by said environment, in response thereto; and

said frequency-shifter comprises a mixer operable to produce said frequency-shifted signals in response to said initial electrical signals and a mixing frequency signal.

59. The system of claim **57** wherein said frequency-shifter comprises at least one mixer and at least one phase-shifter, and is operable to produce, as said frequency-shifted signals, in-phase frequency-shifted signals and in-quadrature frequency-shifted signals.

60. The system of claim **57** further comprising an analog-to-digital converter (ADC) operable to digitize said frequency-shifted signals.

61. The system of claim **48** further comprising an attenuator operable to adjustably attenuate said second signals.

62. The system of claim **40** wherein said processor circuit is configured to define, in said memory device, a data structure comprising a measurement context field for storing measurement context

information, a laser field for storing said data representing said first signals, and a radar beam field for storing said data representing said second signals.

63. The system of claim **40** wherein said processor circuit is configured to store measurement context information in said memory device in association with said data representing said first and second signals.

64. The system of claim **63** wherein said processor circuit is configured to store, as said measurement context information, global positioning satellite (GPS) information indicative of a location at which at least one of said laser beam and said radar beam is received.

65. The system of claim **63** wherein said processor circuit is configured to store, as said measurement context information, at least one time value indicative of a time at which at least one of said laser beam and said radar beam is received.

66. The system of claim **63** wherein said processor circuit is configured to store, as said measurement context information, attenuation information indicative of an amount of attenuation of said second signals.

67. The system of claim **63** wherein said processor circuit is configured to store, as said measurement context information, a frequency value indicative of a frequency of said radar beam.

68. The system of claim **63** wherein said processor circuit is configured to store, as said measurement context information, user-inputted information.

69. The system of claim **68** wherein said processor circuit is configured to store, as said measurement context information, a flight line indication indicative of a flight line over which said laser beam and said radar beam are received by an airborne environment measurement system.

70. The system of claim **40** wherein said processor circuit is configured to store, as said data representing said second signals, an in-phase value and an in-quadrature value representing an in-phase component and an in-quadrature component respectively of said second signals.

71. The system of claim **40** further comprising a representation processing circuit configured to produce said representation of said environment in response to said data.

72. The system of claim **71** wherein said representation processing circuit is configured to apply a migration algorithm to said data representing said second signals, to associate said data representing said second signals with particular locations of said environment.

73. The system of claim **71** wherein said representation processing circuit is configured to identify a foliage height of said environment.

74. The system of claim **71** wherein said representation processing circuit is configured to identify a height of a terrain surface of said environment.

75. The system of claim **74** wherein said representation processing circuit is configured to identify features of said environment below said terrain surface.

76. The system of claim **74** wherein said representation processing circuit is configured to identify a slope of said terrain surface.

77. The system of claim **71** wherein said representation processing circuit is configured to produce a digital elevation model of said environment.

78. The system of claim **71** wherein said representation processing circuit is configured to produce at least one contour representation of said environment.

79. The system of claim **71** wherein said representation processing circuit comprises said processor circuit.

80. An environment measurement system comprising:

means for receiving first signals produced in response to a laser beam scattered by said environment;

means for receiving second signals produced in response to a radar beam scattered by said environment; and

means for storing data representing said first and second signals, for use in producing a representation of said environment.

81. A computer-readable medium storing codes for directing a processor circuit to:

receive first signals produced in response to a laser beam scattered by said environment;

receive second signals produced in response to a radar beam scattered by said environment; and

store data representing said first and second signals, for use in producing a representation of said environment.

82. A signal comprising:

a first code segment for directing a processor circuit to receive first signals produced in response to a laser beam scattered by said environment;

a second code segment for directing said processor circuit to receive second signals produced in response to a radar beam scattered by said environment; and

a third code segment for directing said processor circuit to store data representing said first and second signals, for use in producing a representation of said environment.

83. A data structure comprising:

a laser field for storing data representing first signals produced in response to a laser beam scattered by an environment; and

a radar beam field for storing data representing second signals produced in response to a radar beam scattered by said environment.

84. The data structure of claim **83** further comprising a measurement context field for storing measurement context information.

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85. An environment measurement method comprising:

continuously producing data in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions; and

storing said data, for use in producing a representation of said environment.

86. The method of claim **85** wherein said measurement interval is at least on the order of one microsecond.

87. The method of claim **85** further comprising producing an incident laser pulse having a duration on the order of one nanosecond, for scattering by said environment to produce said scattered portions of said laser pulse.

88. The method of claim **85** further comprising:

receiving said incident laser pulse at a beam directing device; and

adjusting a physical orientation of said beam directing device in response to an orientation signal, to direct said incident laser pulse from said beam directing device to said environment.

89. An environment measurement system comprising:

a memory device; and

a processor circuit in communication with said memory device, wherein said processor circuit is configured to:

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cooperate with a detection system to continuously produce data in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions, and

store said data in said memory device, for use in producing a representation of said environment.

90. The system of claim **89** further comprising said detection system.

91. The system of claim **90** wherein said detection system comprises:

a detector operable to receive said scattered portions and to produce analog signals in response thereto; and

an analog-to-digital converter (ADC) operable to cooperate with said detector to continuously produce digital signals in response to said analog signals, during said measurement interval.

92. The system of claim **89** wherein said processor circuit is configured to define said duration of said measurement interval to be at least on the order of one microsecond.

93. The system of claim **89** further comprising a laser operable to produce an incident laser pulse having a duration on the order of one nanosecond, for scattering by said environment to produce said scattered portions of said laser pulse.

94. The system of claim **89** further comprising:

a beam directing device locatable to receive said incident laser pulse; and

a motion mechanism operable to adjust a physical orientation of said beam directing device in response to an orientation signal, to direct said incident laser pulse from said beam directing device to said environment.

95. An environment measurement system comprising:

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means for continuously producing data in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions; and

means for storing said data, for use in producing a representation of said environment.

96. A computer-readable medium storing codes for directing a processor circuit to:

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cooperate with a detection system to continuously produce data in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions, and

store said data, for use in producing a representation of said environment.

97. A signal comprising:

a first code segment for directing a processor circuit to cooperate with a detection system to continuously produce data in response to scattered portions of a laser pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions, and

a second code segment for directing said processor circuit to store said data, for use in producing a representation of said environment.

98. An environment measurement method comprising:

producing signals in response to a radar beam scattered by said environment and received at an airborne receiver, said radar beam having a wavelength of at least on the order of one meter; and

storing data representing said signals, for use in producing a representation of said environment.

99. The method of claim **98** further comprising receiving said radar beam scattered by said environment at said airborne receiver, said radar beam having a wavelength between **0.7** and **2** meters.

100. The method of claim **98** wherein producing signals comprises continuously producing data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions.

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101. The method of claim 98 further comprising directing an ultra-wide band (UWB) incident radar beam to said environment to produce said radar beam scattered by said environment.

102. An environment measurement system comprising:

an airborne radar reception system operable to produce signals in response to a radar beam scattered by said environment and having a wavelength of at least on the order of one meter; and

a processor circuit in communication with said airborne radar reception system, configured to store data representing said signals, for use in producing a representation of said environment.

103. The system of claim **102** wherein said airborne radar reception system is configured to receive, as said radar beam scattered by said environment, a radar beam having a wavelength between **0.7** and **2** meters.

104. The system of claim **102** wherein said airborne radar reception system is operable to continuously produce data signals in response to scattered portions of a radar pulse scattered by respective portions of said environment, during a measurement interval of sufficient duration to receive all said scattered portions.

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105. The system of claim **104** wherein said airborne radar reception system comprises:

a detector operable to receive said scattered portions and to produce analog signals in response thereto; and

an analog-to-digital converter (ADC) operable to cooperate with said detector to continuously produce digital signals in response to said analog signals, during said measurement interval.

106. The system of claim **102** further comprising a radar transmission system operable to direct an ultra-wide band (UWB) incident radar beam to said environment to produce said radar beam scattered by said environment.

107. An environment measurement system comprising:

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means for producing signals ~~in~~ response to a radar beam scattered by said environment and received at an airborne receiver, said radar beam having a wavelength of at least on the order of one ~~meter~~; and

means for storing data representing said signals, for use in producing a representation of said environment.

108. An environment measurement method comprising:

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receiving data representing signals produced at an airborne receiver in response to a radar beam scattered by said environment; and

applying a migration algorithm to said data, to associate said data with particular locations of said environment.

109. An environment measurement system comprising a processor circuit configured to:

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receive data representing signals produced at an airborne receiver in response to a radar beam scattered by said environment; and

apply a migration algorithm to said data, to associate said data with particular locations of said environment.

110. An environment measurement system comprising:

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means for receiving data representing signals produced at an airborne receiver in response to a radar beam scattered by said environment; and

means for applying a migration algorithm to said data, to associate said data with particular locations of said environment.

111. A computer-readable medium storing codes for directing a processor circuit to:

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receive data representing signals produced at an airborne receiver in response to a radar beam scattered by said environment; and

apply a migration algorithm to said data, to associate said data with particular locations of said environment.

112. A signal comprising:

a first code segment for directing a processor circuit to receive data representing signals produced at an airborne receiver in response to a radar beam scattered by said environment; and

a second code segment for directing a processor circuit to apply a migration algorithm to said data, to associate said data with particular locations of said environment.